Overview

HP P4000 G2 SANs, provide a virtualized pool of storage resources to deliver enterprise SAN functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, grow and maintain, HP P4000 G2 SANs ensure that critical business data remain available. The innovative approach to storage provides a unique data protection level across the entire SAN, reducing vulnerability without driving up costs the way traditional SANs can.

Product Overview

Planning for everything from data growth to disaster recovery to centralized backup to future proofing your infrastructure - these are all daunting tasks for any company no matter what the size. When it comes to the storage part of the design, HP P4000 G2 LeftHand SAN Solutions are a perfect fit for environments with a variety of virtual servers, client virtualization, database, email, and business applications.

P4000 SANs scale capacity and performance linearly to seamlessly grow with your business. The P4000 portfolio has affordable enterprise functionality with a comprehensive feature set and simplified central management for all locations. Superior application availability and disaster recovery features are integrated into the P4000 SANs for automated failover/failback in any situation. P4000 SANs are optimized for virtualized environments with VMware ESX/ESXi & Microsoft Hyper-V integration and offer continuous data availability to users and applications that meets demand on-the-fly.

What's New

Simplified backup and easy recovery: Application integrated and managed snapshots for ESX/ESXi and Hyper-V. Take application consistent snapshots of VMs from the storage system.

- All P4000 G2 SANs are now 2.04 RoHS compliant.
- New LeftHand Recovery Manager simplifies recovery of Windows files and folders, automates snapshot mounting for fast and easy recovery of data, and enables quick searching of data within snapshots.
- High performance solid state tier - New P4900 SSD Storage System - linearly scales IOPS as you grow. Includes integrated SMARTSSD Wear Gauge. Easily add to P4000 environment and migrate volumes online.
- P4800 SAN Solution for BladeSystem now supports 2TB drives for best dollar per GB options in a converged infrastructure! In addition, HP Virtual Connect FlexFabric modules are also supported!
- Zero to VSA Automated Installation and Deployment: Installation of VSA is simplified and accelerated. Scriptable installs allow automated repeatable deployment of VSA configuration.
- Remote Copy performance improvements: Faster replication speeds and shorter RPOs - Saves time by pre-detecting the empty space/unchanged data and only copies changed data.
- Peer Motion data mobility with Cluster Swap: Replace or upgrade P4000 clusters with just a few clicks, no maintenance windows & no downtime required. Migrate data online between tiers non-disruptively
- New SAN Status home page & Best Practice configuration wizard: New look & feel for P4000 CMC with single view of all management groups/key info. New wizards help choose highest availability configs.
- Storage Replication Adaptor for VMware Site Recovery Manager 5: Integration streamlines/automates disaster recovery with P4000 and ESX/ESXi.

Overview

HP P4000 G2 SANs Models At a Glance:

- Portfolio of highly scalable, easy to use SAN solutions with superior HA and DR capabilities
- Perfect match for server virtualization, client virtualization, Windows, and Linux environments
- Rack mount form factor for Starter SANs, Virtualization SAN, Multi-site SAN and Scalable Capacity SAN Solutions
- BladeSystem SAN Solution for Client Virtualization (VDI) deployments and Enterprise workloads.
- Intel® Xeon® 5500 / 5600 series CPU
- SSD, SAS or MDL SAS drives available
- P4000 SAN/iQ Software delivers
  - Storage Clustering for disruption free growth
  - Network RAID 0, 5, 6, 10, 10+1, and 10+2 (Synchronous Replication)
  - Thin Provisioning
  - Application Integrated Snapshots
  - Remote Copy (Asynchronous Replication with Bandwidth Throttling)
  - Multi-Site HA/DR Solution (Synchronous Replication across several locations)
  - Online Volume Migration and automated Software Upgrades
  - Self-Healing Storage: Proactive disk / volume scrubbing with automatic bad block repair
- Storage Controllers: minimum of 2 per SAN, a cluster of 3 Storage systems provides triple redundancy
- Network RAID Levels (per volume) 0, 5, 6, 10, 10+1, and 10+2 protect against double disk, controller, storage node, power, network, or site failure
- Hardware RAID Levels 10, 5, 6 (default is level 5)
- Hardware Availability features
  - Hot-plug hard drives
  - Redundant power supplies
  - Integrated storage controller w/ battery-backed cache
  - Hyper-redundant clustered storage (achieved in combination with the P4000 SAN/iQ storage software)
- HP LeftHand P4000 Virtual SAN Appliance Software for VMware ESX and Microsoft Hyper-V transforms server disk drives and external legacy storage into a virtual iSCSI SAN
- HP ProLiant Integrated Lights-Out 2/3 Remote Management
- HP Insight Remote Support delivers 24x7 secure remote support
- 1200W 48V DC power supplies supported for P4300 G2 and P4500 G2

	P4300 MDL SAS Starter SAN	P4300 SAS Starter SAN	P4500 Virtualization SAN	P4500 Multi-Site SAN	P4500 Scalable Capacity SAN	P4800 SAN for BladeSystem	P4900 SSD SAN	P4300, P4500, & P4900 Storage Systems
Number of Nodes per P4000 SAN[1]	2 - 32	2 - 32	2 - 32	4 - 32	5 - 32	2 - 32	2 - 32	1 - 32
Number of drives	16 - 256	16 - 256	24 - 384	48 - 384	60 - 384	70 - 1120	16 - 256	Varies
Capacity	16 - 256TB MDL SAS	7.2 - 115TB 15K SAS	14.4 - 230 TB 15K SAS	28.8 - 230 TB 15K SAS	120 - 768 TB MDL SAS	31.5 - 2240 TB 15K SAS	6.4 - 102.4 TB SSD	Varies
CPUs	2 - 32	2 - 32	2 - 32	4 - 32	5 - 32	2 - 32	2 - 32	Varies
RAID Controllers	2 - 32	2 - 32	2 - 32	4 - 32	5 - 32	2 - 32	4 - 64	Varies
Memory	8 - 128GB	8 - 128GB	12 - 192GB	24 - 192GB	30 - 192GB	48 -768GB	12 - 192GB	Varies
Controller Cache	1 - 16GB	1 - 16GB	1 - 16GB	2 - 16GB	2.5 - 16GB	2 - 16GB	2 - 32GB	Varies
Storage Ports (1GbE Standard)	4 - 64	4 - 64	4 - 64	8 - 64	10 - 64	n/a	4 - 64	2 - 64

Overview

Storage Ports (10GbE Standard on P4800 / P4900 Optional on others)	4 - 64	4 - 64	4 - 64	8 - 64	10 - 64	4 - 64	4 - 64	2 - 64
Bandwidth (1GbE Standard)	4 - 64 Gbit/sec	4 - 64 Gbit/sec	4 - 64 Gbit/sec	8 - 64 Gbit/sec	10 - 64 Gbit/sec	n/a	4 - 64 Gbit/sec	2 - 64 Gbit/sec
Bandwidth (10 GbE Standard)	40 - 640 Gbit/sec	40 - 640 Gbit/sec	40 - 640 Gbit/sec	80 - 640 Gbit/sec	100 - 640 Gbit/sec	40 - 640 Gbit/sec	40 - 640 Gbit/sec	Varies
Dual Active/Active Controllers	Included							Requires 2 Systems
SAN/iQ software features	Storage Clustering, Network RAID 5/6/10, Thin Provisioning, Application Integrated Snapshots, SmartClone, Remote Copy							
Storage Protocol Support	1GbE iSCSI / 10GbE iSCSI / CIFS (SMB 2.0)[2] / NFS[2] / HTTP[2] / FTP[2]							
Customer Self Installable	Yes					Factory Integrated/ Field Installable	Yes	
Application Integration Solution Pack	Included							
P4000 Replication for Remote Offices Licenses[3]	Optional via VSA licenses		Included (VSA 10 license pack, 10TB each)		Optional via VSA licenses			
Multi-Site HA/DR Solution	Included							
Supported Languages / Locales	English (United States), Chinese (China), Japanese, Korean, Spanish							
Software Support, 9x5 NBD	3 years							1 year
Maintenance On-Site, NBD	3 years							1 year

[1]Up to 50 SANs can be managed by the P4000 Centralized Management Console single pane of glass.
[2]CIFS (SMB2.1), NFS, HTTP & FTP support available on all P4000 SAN Solutions with addition of P4000 G2 Unified NAS Gateway.
[3]More information available about VSA in the Software section.

Features and Benefits

All inclusive feature set enables enterprise functionality at an affordable price

- Storage Clustering simplifies scalability
  Storage Clustering allows a customer to consolidate multiple storage nodes into pools of storage. All available capacity and performance is aggregated and available to every volume in the cluster. As storage needs increase the HP P4000 G2 can scale performance and capacity on-line.
- Network RAID delivers new levels of data availability
  Network RAID stripes and protects multiple copies of data across a cluster of storage nodes, eliminating any single point of failure in the HP P4000 G2 SAN. Applications have continuous data availability in the event of a disk, controller, storage node, power, network, or site failure. Choose the right network RAID level for each volume in the cluster based on capacity and performance needs.
- Thin Provisioning reduces costs by increasing storage efficiency
  Thin Provisioning allocates space only as data is actually written without requiring pre-allocation of storage. This raises the overall utilization and efficiency of the HP P4000 G2 SAN, reduces costs and ultimately increases the ROI.
- Application Integrated Snapshots for VMware and Windows simplify data protection
  Snapshots create thinly provisioned, instant point-in-time copies of data on a per-volume basis. Administrators access snapshots to recover individual files from the volume, or rollback an entire volume. Built-in application integration provides automated quiescing for VMware and Hyper-V VMs and Microsoft VSS applications.
- Remote Copy reduces costs for disaster recovery
  Remote Copy replicates snapshots between P4000 G2 SANs at primary/remote locations. Copies are thinly provisioned with no space reservation required. Remote Copy enables centralized backup and disaster recovery on a per-volume basis and leverages application integrated snapshots for faster recovery.

Superior availability and disaster recovery

- Data remains available during site failures with P4000 Multi-Site Solution
  HP P4000 G2 SANs stripe and protect multiple copies of data across a cluster of storage nodes, eliminating any single point of failure in the SAN. Applications have continuous data availability in the event of a disk, controller, storage node, power, network, or site failure.
- Integrated replication for disaster recovery
  HP P4000 G2 SANs include integrated replication at no additional cost that simplifies management with simple failover and failback.
- Change configurations without incurring downtime
  Administrators can add capacity, increase performance, grow and migrate volumes between HP P4000 G2 SAN clusters on the fly with no application downtime.

Scalable Performance

- Purchase only what you need today
  Avoid up-front cost and the potential performance constraints. Purchase only what's needed today, then grow the performance, capacity, and redundancy of your P4000 G2 SAN online as storage requirements evolve. Buying storage only when needed simplifies planning and relieves budget pressures.
- Scale performance and capacity simultaneously
  Each time a storage node is added to the P4000 G2 SAN, the capacity, performance, and redundancy of the entire storage solution increases.
- Avoid disruptive upgrades
  Add resources to the P4000 G2 SAN non-disruptively as capacity and performance requirements increase. Applications remain online during maintenance events (adding nodes, updating software or firmware) for best in class availability.
- 10GbE upgrade available

Features and Benefits

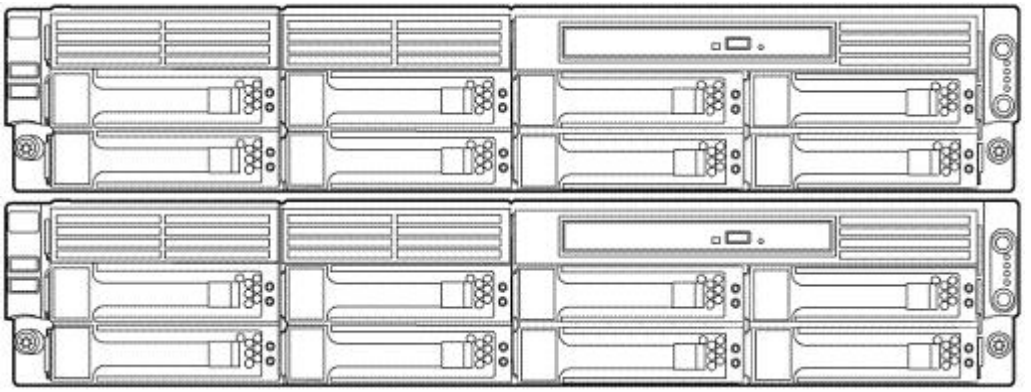
Easy to manage SANs for virtualized environments

- Centralized Management Console
  Multiple data centers and sites can be managed from an all inclusive "single pane-of-glass." All of the P4000 G2 SAN features are managed from the Centralized Management Console (CMC) for simple, easy-to-manage storage.
- Business continuance with integrated HA and DR
  Every P4000 G2 SAN includes integrated synchronous and asynchronous replication at no additional cost. This reduces costs and simplifies management of high availability/fault tolerant and disaster recovery storage solutions.
- Industry leading VMware integration
  vStorage / VAAI array offload integration, HP Insight Control Storage Module for vCenter, Native ESX MPIO / PSA support, Site Recovery Manager adapter, and the only SVA certified Virtual SAN Appliance www.hp.com/go/vsa
- Best practice analyzer
  Ensuring best-in-class operation with built-in best-practice analyzer which automatically recommends SAN best practices and how to implement those.
- LeftHand P4000 Virtual SAN Appliance Software
  Turn any Microsoft or VMware virtualized server's internal and/or external storage into a virtual SAN, without the expense of added storage hardware.
- P4000 G2 Unified NAS Gateway
  Boosts the value of P4000 SAN Solutions by adding Windows-powered IP-based gateway services. Fully featured NAS gateway includes support for multiple file protocols (CIFS, NFS, etc.), deduplication, print services and high availability through Microsoft Clustering.
- Reference Architectures for Client Virtualization
  VDI and client virtualization deployments are aided with the P4000 reference architectures for VMware and Citrix for projects of all sizes.

HP P4000 G2 SANs, representing a virtualized pool of storage resources, deliver enterprise SAN functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HP P4000 G2 SANs ensure that critical business data remain available. The innovative approach to storage provides a unique data protection level across the entire SAN, reducing vulnerability without driving up costs the way traditional SANs can. Each P4000 SAN includes hardware, software, and 3yrs support to get you up and running in one swift motion.

Models

HP P4300 G2 Starter SAN Solutions



HP P4300 G2 MDL SAS Starter SAN Solution

HP P4300 G2 16TB MDL SAS Starter SAN Solution — BK715B

MDL SAS Starter SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

MDL SAS Starter SAN Hardware:

- Dual redundant, active-active storage controllers
- 16 MDL SAS Drives, 1TB, 7,200 RPM
- 8 GB RAM
- Redundant hot swap power supplies
- 1024 MB battery backed cache
- Support for RAID 5, 6, 10
- 4 1Gbit NIC ports
- iLO2 Management
- Integrated DVD/CD-Rom
- 1200W 48V DC power supplies supported

MDL SAS Starter SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware

- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

- Each sku contains the following major components:
  - Two P4300 G2 Storage Systems, each with eight 1TB LFF MDL SAS drives

Expansion Option:

HP P4300 G2 8TB MDL SAS Storage System — BK719B

HP P4300 G2 SAS Starter SAN Solution

HP P4300 G2 7.2TB SAS Starter SAN Solution — BK716B

SAS Starter SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

SAS Starter SAN Hardware:

- Dual redundant, active-active storage controllers
- 16 SAS Drives, 450GB, 15,000 RPM
- 8 GB RAM
- Redundant hot swap power supplies
- 1024 MB battery backed cache
- Support for RAID 5, 6, 10
- 4 1Gbit NIC ports
- iLO2 Management
- Integrated DVD/CD-Rom
- 1200W 48V DC power supplies supported

SAS Starter SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

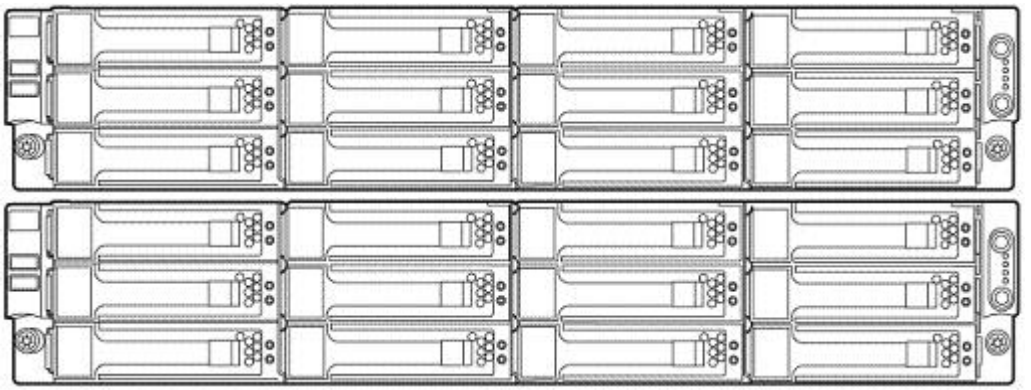
What's in the Box:

- Each sku contains the following major components:
  - Two P4300 G2 Storage Systems, each with eight 450GB LFF 15K SAS drives

Expansion Option:

HP P4300 G2 3.6TB SAS Storage System BK718B

HP P4500 G2 Virtualization SAN Solutions



HP P4500 G2 Virtualization SAN Solution

HP P4500 G2 14.4TB SAS Virtualization SAN Solution BQ888B

Virtualization SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack
- P4000 Replication for Remote Offices (VSA DR for 10 remote sites)

Virtualization SAN Hardware:

- Dual redundant, active-active storage controllers
- 24 600 GB 15K SAS disk drives
- 12 GB RAM
- Redundant hot swap power supplies
- 1,024 MB battery backed cache
- Support for RAID 5, 10, 6
- 4 1Gbit NIC ports
- iLO2 Management

- Integrated DVD/CD-Rom
- 1200W 48V DC power supplies supported

Virtualization SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

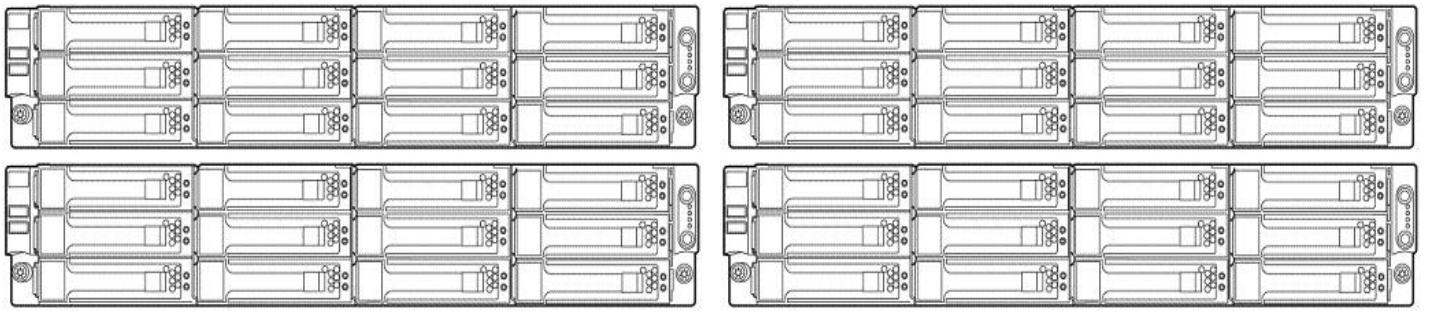
What's in the Box:

- Each sku contains the following major components:
  - Two P4500 G2 Storage Systems, each with twelve 600GB LFF 15K SAS drives
  - 10 VSA licenses (**NOTE:** Ensure that the 10 VSA licenses are registered / authorized at the same time as the primary storage systems of the Virtualization SAN to properly activate support. Not registering the VSA licenses at the same time as the Storage Systems may invalidate support terms.)

Expansion Option:

HP P4500 G2 7.2TB SAS Storage System — AX701B

HP P4500 G2 Multi-Site SAN Solutions



Site 1 Site 2

HP P4500 G2 Multi-Site SAN Solution

HP P4500 G2 28.8TB SAS Multi-Site SAN Solution — BQ889B

Multi-site SAN Software:

- Dual active/active site failover
- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning

- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Solution Pack for Microsoft Windows
- P4000 Replication for Remote Offices (VSA DR for 10 remote sites)

Multi-site SAN Hardware:

- Dual redundant active-active controllers
- 48 600 GB 15K SAS disk drives, 24 per site
- 24 GB RAM
- Redundant hot swap power supplies
- 2,048 MB battery backed cache
- Support for RAID 5, 10, 6
- 8 1Gbit NIC ports, 4 per site
- iLO2 Management
- Integrated DVD/CD-Rom
- 1200W 48V DC power supplies supported

Multi-site SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

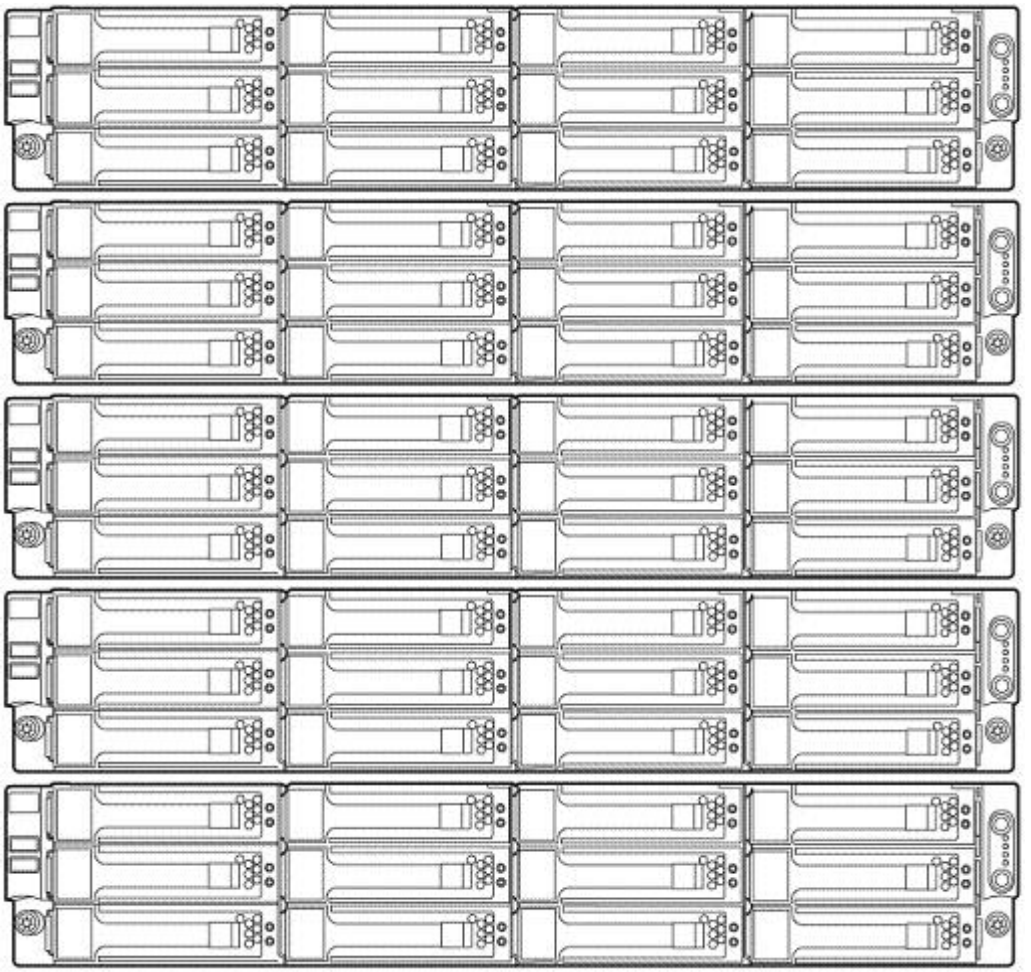
- Each sku contains the following major components:
  - Four P4500 G2 Storage Systems, each with twelve 600GB LFF 15K SAS drives
  - 10 VSA licenses (**NOTE:** Ensure that the 10 VSA licenses are registered / authorized at the same time as the primary storage systems of the Multi-site SAN to properly activate support. Not registering the VSA licenses at the same time as the Storage Systems may invalidate support terms.)

Expansion Options:

HP P4500 G2 7.2TB SAS Storage System	AX701B
HP P4500 G2 14.4TB SAS Virtualization SAN Solution	BQ888B

Family Information

HP P4500 G2 Scalable Capacity SAN Solutions



HP P4500 G2 60TB Scalable Capacity SAN Solution	HP P4500 G2 60TB MDL SAS Scalable Capacity SAN Solution	BK717B

Scalable Capacity SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

Scalable Capacity SAN Hardware:

- Five redundant active-active scalable controllers
- 60 1TB 7.2K MDL SAS disk drives
- 30 GB RAM
- Redundant hot swap power supplies

- 2,560 MB battery backed cache
- Support for RAID 5, 10, 6
- 10 1Gbit NIC ports
- iLO2 Management
- Integrated DVD/CD-Rom
- 1200W 48V DC power supplies supported

Scalable Capacity SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

- Each sku contains the following major components:
  - Five P4500 G2 Storage Systems, each with twelve 1TB LFF MDL SAS drives

Expansion Option:

	HP P4500 G2 12TB MDL SAS Storage System	AX703B
HP P4500 G2 120TB Scalable Capacity SAN Solution	HP P4500 G2 120TB MDL SAS Scalable Capacity SAN Solution	BQ890B

Scalable Capacity SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

Scalable Capacity SAN Hardware:

- Five redundant active-active scalable controllers
- 60 2TB 7.2K MDL SAS disk drives
- 30 GB RAM
- Redundant hot swap power supplies
- 2,560 MB battery backed cache
- Support for RAID 5, 10, 6
- 10 1Gbit NIC ports
- iLO2 Management
- Integrated DVD/CD-Rom

1200W 48V DC power supplies supported

Scalable Capacity SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

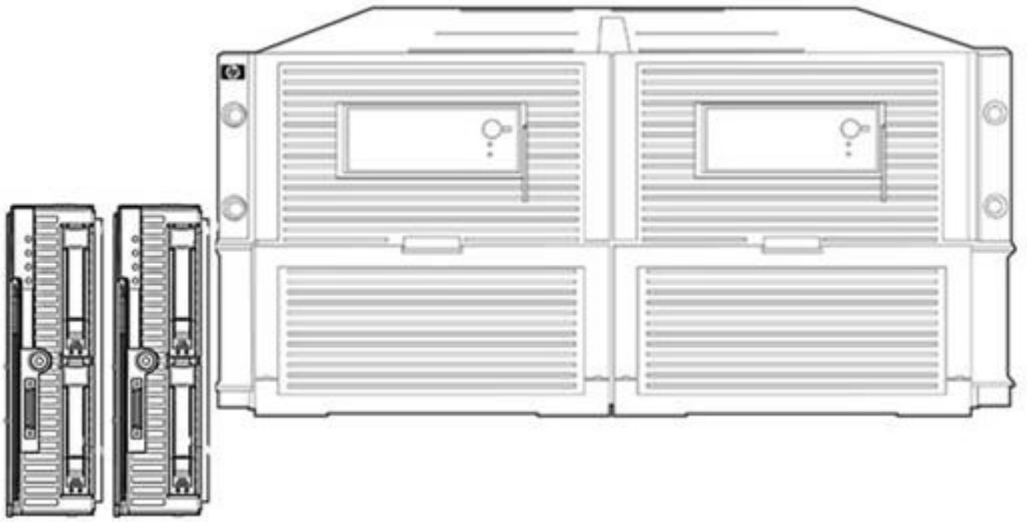
What's in the Box:

- Each sku contains the following major components:
  - Five P4500 G2 Storage Systems, each with twelve 2TB LFF MDL SAS drives

Expansion Option:

HP P4500 G2 24TB MDL SAS Storage System AX704B

HP P4800 G2 SAN Solutions for BladeSystem



HP P4800 G2 31.5TB SAS SAN Solution for BladeSystem

HP P4800 G2 31.5TB SAS SAN BladeSystem BV931A

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

Family Information

BladeSystem SAN Hardware:

- Two redundant active-active scalable P4460sb G2 Storage Blades for BladeSystem c-Class Enclosure
- One MDS600 enclosure with 70 450GB 15K SAS disk drives
- Four Mini SAS 2m cables
- 48GB RAM
- 1,024 MB battery backed cache
- Support for RAID 5, 10, 6
- Four 10Gbit NIC ports
- iLO3 Management

BladeSystem SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- BladeSystem SAN Solutions are Factory Integrated* or Field Installable (with associated installation services).

  *P4800 Factory Integrated Solutions must be ordered in a C7000 enclosure, with two Virtual Connect Flex-10 modules or two Virtual Connect FlexFabric modules, two 3Gb 8 port SAS 2.0 BLc Switch Modules, PDU and a rack system. These items are not included with the P4800.

NOTE: P4800 G2 supports VC Flex-10 Ethernet functionality VC FlexFabric modules. At this time, there is no support for FCoE functionality.

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

- Each sku contains the following major components:
  - Two P4460sb G2 Storage Blades
  - One MDS600 enclosure with 70 450GB 15K SAS disk drives

HP P4800 G2 42TB SAS SAN Solution for BladeSystem

HP P4800 G2 42TB SAS SAN BladeSystem BV932A

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Application Integration Solution Pack

BladeSystem SAN Hardware:

- Two redundant active-active scalable P4460sb G2 Storage Blades for

BladeSystem c-Class Enclosure
- One MDS600 enclosure with 70 600GB 15K SAS disk drives
- Four Mini SAS 2m cables
- 48GB RAM
- 1,024 MB battery backed cache
- Support for RAID 5, 10, 6
- Four 10Gbit NICs
- iLO3 Management

BladeSystem SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- BladeSystem SAN Solutions are Factory Integrated* or Field Installable (with associated installation services).

*P4800 Factory Integrated Solutions must be ordered in a C7000 enclosure, with two Virtual Connect Flex-10 modules or two Virtual Connect FlexFabric modules, two 3Gb 8 port SAS 2.0 BLc Switch Modules, PDU and a rack system. These items are not included with the P4800.

NOTE: P4800 G2 supports VC Flex-10 Ethernet functionality VC FlexFabric modules. At this time, there is no support for FCoE functionality.

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

- Each sku contains the following major components:
  - Two P4460sb G2 Storage Blades
  - One MDS600 enclosure with 70 600GB 15K SAS disk drives

HP P4800 G2 140TB MDL SAS SAN Solution for BladeSystem

HP P4800 G2 140TB MDL SAS SAN BladeSystem BV933A

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows

BladeSystem SAN Hardware:

- Two redundant active-active scalable P4460sb G2 Storage Blades for BladeSystem c-Class Enclosure
- One MDS600 enclosure with 70 2TB MDL SAS disk drives
- Four Mini SAS 2m cables

- 48GB RAM
- 1,024 MB battery backed cache
- Support for RAID 5, 10, 6
- Four 10Gbit NICs
- iLO3 Management

BladeSystem SAN Services:

- P4000 SAN Solutions include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 SAN Solutions is 1yr, 9x5, NBD for Hardware
- BladeSystem SAN Solutions are Factory Integrated* or Field Installable (with associated installation services).

  *P4800 Factory Integrated Solutions must be ordered in a C7000 enclosure, with two Virtual Connect Flex-10 modules or two Virtual Connect FlexFabric modules, two 3Gb 8 port SAS 2.0 BLc Switch Modules, PDU and a rack system. These items are not included with the P4800.

NOTE: P4800 G2 supports VC Flex-10 Ethernet functionality VC FlexFabric modules. At this time, there is no support for FCoE functionality.

Customer Training:

A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

- Each sku contains the following major components:
  - Two P4460sb G2 Storage Blades
  - One MDS600 enclosure with 70 2TB MDL SAS disk drives

HP P4900 G2 SSD Storage Systems

HP P4900 G2 6.4TB SSD Storage System	HP P4900 G2 6.4TB SSD Storage System	QW932A

P4900 G2 Storage System Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

P4900 G2 Storage System Hardware:

- Dual redundant, active-active storage controllers
- 16 Enterprise Flash Drives, 400GB SLC SAS
- 12 GB RAM
- Redundant hot swap power supplies
- Quad P410 RAID Controllers
- 2048 MB battery backed cache
- 4 10GbE NIC ports
- 4 1Gbit NIC ports
- Support for RAID 5
- iLO2 Management

P4900 G2 Services:

- P4000 2 Unit Bundled Storage Systems include services resulting in 3yrs of HW&SW, 9x5, NBD
- Factory warranty for all P4000 Storage Systems is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

Customer Training:

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

What's in the Box:

- Each sku contains the following major components:
  - Two P4900 G2 Storage Systems, each with eight 400GB SFF SLC SAS drives

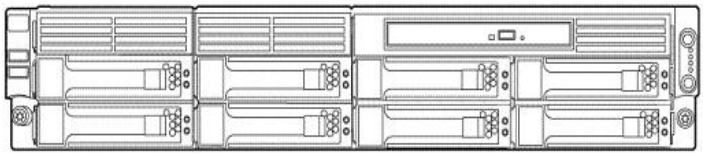
HP Solid State Drives are equipped with HP SMARTSSD Wear Gauge™ which reports the amount of drive lifetime remaining. This data is made visible to the user through the user interface of the Centralized Management Console of HP LeftHand Storage Systems and via SNMP. The combination of HP SMARTSSD Wear Gauge and HP LeftHand appliance ensures you know the status of your solid state drives at all time so that you never need to worry about the loss of data due to drive wear.

For more information on maximum usage limitations, view the HP SAS Solid State Drive quickspecs at:
http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html

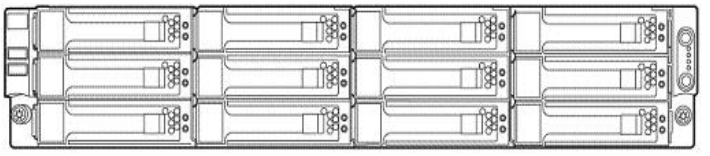
Expansion Option:

HP P4900 G2 3.2TB SSD Storage System QW933A

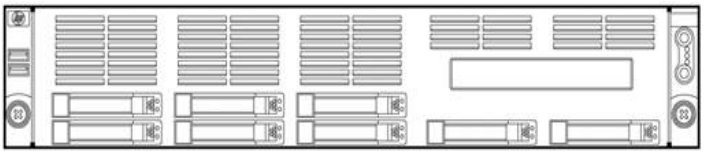
HP P4300/P4500 G2 Storage Systems



P4300 G2 Storage System



P4500 G2 Storage System



P4900 G2 Storage System

HP P4300/P4500/P4900 G2 Storage Systems

The P4300/P4500/P4900 G2 Storage Systems are single SKU bundle configurations. P4300/P4500/P4900 G2 Storage System Custom Solutions include the following:P4300/P4500/P4900 G2 Storage System Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID (synchronous replication)
- SAN/iQ Thin Provisioning
- SAN/iQ Application Integrated Snapshots
- SAN/iQ Remote Copy (asynchronous replication)
- SAN/iQ Multi-Site/DR Solution (synchronous replication across locations)
- SAN/iQ Application Integration Solution Pack

P4300/P4500/P4900 G2 Storage System Hardware:

- SLC SAS,15K SAS, or 7.2K MDL SAS HDDs
- 4GB RAM (6GB for P4500 G2 models with drives 600GB and larger, and P4900 G2 models)
- Redundant hot swap power supplies
- 512 MB battery backed cache per RAID controller
- Support for RAID 5, 6, 10* (P4900 G2 supports RAID 5 only)
- Dual port 1Gbit NIC (P4900 G2 also has a dual port 10GbE NIC)
- iLO2 Management*
- Integrated DVD/CD-Rom (not in P4900 G2)
- 1200W 48V DC power supplies supported for P4300 G2 and P4500 G2

P4300/P4500/P4900 Services:

- P4000 Storage Systems include services resulting in 1yr, 9x5, NBD for HW&SW
- Factory warranty for all P4000 Storage Systems is 1yr, 9x5, NBD for Hardware
- Installation & Startup services are available from HP & HP resellers. Installation and startup can be performed by customers

* All P4000 SAN Solutions and Storage Systems ship with one year of firmware update support for Smart Array Advanced Pack and iLO2 Management. After one year, all supported features remain functional, but newer updates are not applied.

Customer Training:

Family Information

- A two day training course for P4000 SAN Solutions is available and recommended. Select the part number HF383E (QTY 2) from the HP Education tab

HP P4300 G2 Storage System	HP P4300 G2 2.4TB SAS Storage System: 8 SAS Drives, 300 GB, 15,000 RPM	AX698B
	HP P4300 G2 3.6TB SAS Storage System: 8 SAS Drives, 450 GB, 15,000 RPM	BK718B
	HP P4300 G2 8TB MDL SAS Storage System: 8 MDL SAS Drives, 1TB, 7,200 RPM	BK719B
HP P4500 G2 Storage System	HP P4500 G2 3.6TB SAS Storage System:12 SAS Drives, 300GB, 15,000 RPM	AX699B
	HP P4500 G2 5.4TB SAS Storage System:12 SAS Drives, 450GB, 15,000 RPM	AX700B
	HP P4500 G2 7.2TB SAS Storage System:12 SAS Drives, 600GB, 15,000 RPM	AX701B
	HP P4500 G2 12TB MDL SAS Storage System:12 MDL SAS Drives, 1TB, 7,200 RPM	AX703B
	HP P4500 G2 24TB MDL SAS Storage System:12 MDL SAS Drives, 2TB, 7,200 RPM	AX704B
HP P4900 G2 Storage System	HP P4900 G2 3.2TB SSD Storage System: 8 Enterprise Flash Drives, 400GB SLC SAS	QW933A
HP P4300 / P4500 G2 Spare Components	While HP P4000 G2 Storage Systems have everything you need to be up and running, the following spare kits are available for purchase.	
	HP 2U Redundant Fan Kit	516009-B21
	HP 750W Common Slot Platinum Hot Plug Power Supply Kit (P4900 G2)	593831-B21
	HP 750W Common Slot Gold Hot Plug Power Supply Kit (P4300 G2 and P4500 G2)	512327-B21
	HP 1200W Common Slot -48VDC Hot Plug Power Supply Kit **NOTE:** Both P4300 G2 and P4500 G2 Storage Systems support DC power supplies. To enable DC support for each Storage System, two HP 1200W 48V DC common slot power supply kits must be purchased in addition to those originally shipped with the Storage System. DC power supplies contain a -48V DC power cord designed for rack DC power rectifiers.	437573-B21
	HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
	HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
	HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
	HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632494-B21

HP Solid State Drives are equipped with HP SMARTSSD Wear Gauge™ which reports the amount of drive lifetime remaining. This data is made visible to the user through the user interface of the Centralized Management Console of HP LeftHand Storage Systems and via SNMP. The combination of HP SMARTSSD Wear Gauge and HP LeftHand appliance ensures you know the status of your solid state drives at all time so that you never need to worry about the loss of data due to drive wear.

For more information on maximum usage limitations, view the HP SAS Solid State Drive quickspecs at
http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html

HP LeftHand P4000 Virtual SAN Appliance Software

HP LeftHand P4000 Virtual SAN Appliance Software

HP LeftHand P4000 Virtual SAN Appliance Software Stock LTU — TA688AB

- Includes copy of SAN/iQ Software media and documentation stock-able by the channel
- Installable on either VMware ESX or Microsoft Hyper-V
- Up to 10 TB capacity licensed per Virtual SAN Appliance (VSA)
- Includes 1 yr of software support for each license

NOTE: Requires 2GHz proc, 1GB RAM, 1 virtual network

HP LeftHand P4000 Virtual SAN Appliance Software LTU — TA688AA

- Includes copy of SAN/iQ Software media and documentation not stock-able by the channel, must order as drop ship and have single end-user quantities represented on the order.
- Installable on either VMware ESX or Microsoft Hyper-V
- Up to 10 TB capacity licensed per Virtual SAN Appliance (VSA)
- Includes 1 yr of software support for each license

NOTE: Requires 2GHz proc, 1GB RAM, 1 virtual network

HP LeftHand P4000 Virtual SAN Appliance Software E-LTU — TA688AAE

- Electronic SAN/iQ Software product entitlement
- Installable on either VMware ESX or Microsoft Hyper-V
- Up to 10 TB capacity licensed per Virtual SAN Appliance (VSA)
- Includes 1 yr of software support for each license

NOTE: Requires 2GHz proc, 1GB RAM, 1 virtual network

HP LeftHand P4000 Virtual SAN Appliance Software - Demo and Evaluation Versions

HP LeftHand P4000 VSA Laptop Demo Software Version

- Fully functional SAN/iQ Software 60-day evaluation pre-formatted for demonstration on laptops and PC's
- Up to 4.5 TB capacity per Virtual SAN Appliance (VSA)
- Support not included
- Download at www.hp.com/go/tryvsa

NOTE: Requires VMware Player, Workstation, or Server, 384 MB RAM and 1 virtual network

HP LeftHand VSA Full Evaluation Version Software for VMware ESX / Microsoft Hyper-V

- Fully functional SAN/iQ Software 60-day evaluation pre-formatted for VMware ESX / Microsoft Hyper-V
- Up to 10 TB capacity licensed per Virtual SAN Appliance (VSA)
- Support not included
- Download at www.hp.com/go/tryvsa

NOTE: Requires VMware ESX or ESXi/ Microsoft Windows 2008 or 2008 R2 with Hyper-V, 1GB RAM and 1 virtual network

Hardware Prerequisites for Virtual SAN Appliance Software

HP LeftHand P4000 Virtual SAN Appliance Software requires a ESX or Hyper-V server with at least:

- 1GB of RAM
- 1 virtual CPU with 2GHz
- 5GB to 2TB of disk space per virtual disk file, up to 10TB total per VSA
- A dedicated Gigabit virtual switch

HP P4000 G2 SANs Product Information:

Overview	
Server Compatibility	**Supports most HP ProLiant servers including HP ProLiant DL, SL, ML and c-Class Blade Servers**
Industry Standard x86/x64 servers support	• **Supports most multi-vendor industry standard 32-bit and 64-bit Intel and AMD based servers. HP requires the Third-Party Server to be logo'd and listed on the Microsoft Windows Server Catalog.** • **Refer to the Microsoft website: http://www.microsoft.com/windows/catalog/server/** • **HP recommends that the Third-Party Server Vendor is an active member of TSANet. Refer to the TSANet website for details: www.tsanet.com**
OS Support	• **Microsoft Windows Server 2003 R2 - all editions, x86/x64** • **Microsoft Windows Server 2008 - all editions, x86/x64** • **Microsoft Windows Server 2008 R2 - all editions** • **VMware ESX/ESXi 3.5** • **VMware vSphere ESX / ESXi Server 4, 4.1 and 5.0** • **VMware Site Recovery Manager** • **Oracle 10g, 11g** • **Red Hat Enterprise Linux AS 4.7 / 4.8** • **Red Hat Enterprise Linux 5.4 / 5.5 / 5.6** • **Red Hat Enterprise Linux 6** • **SUSE Linux Enterprise Server 10 / 10.1 / 10.2 / 11** • **Fedora 11 / 12 / 13** • **Ubuntu Server Edition 9.04 / 10.04/ 10.10/ 11.04** • **Solaris 10/ 11** • **HP-UX 11i v2 (11.23) / v3 (11.31)** • **IBM AIX 6.1** • **Citrix XenServer 5.0 / 5.5 / 5.6** • **Apple OS X 10.5.6 / 10.5.7 / 10.5.8**
Interconnects	• **2ea 1 GbE iSCSI, optional upgrade to 10 GbE**

Management	• **The Centralized Management Console supports**
	  ○ **Windows XP**
	  ○ **Windows Vista**
	  ○ **Windows 7**
	  ○ **Windows Server 2003 R2**
	  ○ **Windows Server 2008**

	○ **Windows Server 2008 R2** ○ **SUSE Linux Enterprise 10 / 11** ○ **RedHat Enterprise Linux 4 / 5.0 / 5.1/ 5.2/ 5.3/ 5.4/ 5.5/ 5.6/ 6.1** ○ **Fedora 11 / 12 / 13** ○ **HP-UX 11i v2 (11.23) / v3 (11.31)** • **HP ProLiant Integrated Lights-Out 2/3 Remote Management Baseboard Mgmt Controller IPMI 2.0**

NOTE: For the latest information visit: http://hp.com/go/p4000compatibility

HP P4000 G2 All Inclusive Software

Product Features

Storage Clustering

- SAN/iQ Storage Clustering allows a customer to create pools of storage by consolidating storage nodes on the network into clusters. Storage Clustering provides online scalability, both within a volume and across the entire storage pool. All available physical capacity is aggregated and available to the volumes created on the SAN.
- In order to scale capacity and/or performance, the IT administrator simply adds nodes to the storage cluster. SAN/iQ software automatically redistributes the data for optimal data availability and performance. All the capacity, processing power, and bandwidth included in each node are aggregated into the entire SAN, ensuring an increase in performance as the SAN grows. To make the process even easier, HP P4000 SANs let IT administrators expand volumes and add storage nodes online, without taking the volumes offline or causing application downtime.
- Customers can use SAN/iQ Storage Clustering to implement different tiers of storage in their SAN. For instance a storage cluster of SAS-based storage nodes can be implemented for performance while a storage cluster of MDL SAS-based storage nodes is implemented for higher density, all managed from a single interface.

Network RAID

- For increased access to the SAN, customers can install storage nodes anywhere on the IP network. P4000 nodes in a cluster can be spread out between several racks on a floor, across several floors in a building, or across buildings on a campus site or a metropolitan area. Typical round trip latency should be 2 milliseconds or less. A single P4000 SAN can thus eliminate the risk of data loss in the event of a disk, controller, storage node, power, network, or site failure.
- SAN/iQ Network RAID stripes and protects multiple copies of data across a cluster of storage nodes, eliminating any single point of failure in the HP P4000 G2 SAN. Applications have continuous data availability in the event of a power, network, disk, controller, or entire storage node failure.
- SAN administrators can manage redundancy on a per-volume basis to optimize storage utilization and match the data protection of the volume to the application data on that volume. Customers choose from Network RAID level 0, 5, 6, 10, 10+1, or 10+2 to protect data across the storage nodes, only allocating additional storage space for data that warrants additional protection. For increased protection, Network RAID can also be integrated into environments where application servers are clustered, enabling true, seamless, geo-cluster solutions that provide both application and storage clustering across geographies.

Thin Provisioning

- Most SAN vendors place the provisioning burden on SAN administrators, asking them to predict how much space will be needed in the future for volumes, snapshots and remote copies, and what the SAN's expected growth rate will be. That information is required because most storage provisioning models call for pre-allocation of storage space on the SAN. Errors in estimation are inevitable, and can be expensive or cause snapshots and backups to fail. Worse yet, if administrators over-allocate storage, it is nearly impossible to reclaim that unused space.
- P4000 G2 SANs do not require pre-allocation of storage space. SAN/iQ software manages all the storage allocations underneath a given volume, and the Thin Provisioning feature allocates space only as data is actually written to that volume. SAN/iQ Thin Provisioning allows customers to purchase only the storage needed today and then add more storage to the clusters as application data grows. This raises the overall utilization and efficiency of the SAN and ultimately increases the ROI associated with the SAN.

Application Integrated Snapshots

- The P4000 Application Aware Snapshot Manager provides allows for the creation of application consistent snapshots of VMware and Hyper-V VMs and of Microsoft VSS enabled applications.
- Application Integrated snapshots create instant point-in-time copies of data on a per-volume basis. Snapshots can be created in a variety of ways to meet business or application requirements. Administrators can create them manually ad-hoc, on a scheduled or scripted basis, or via the Microsoft VSS framework, and can then access these point-in-time snapshots to recover individual files or folders from the volume, or rollback an entire volume. Unlike most SAN vendors that require a snapshot reservation, SAN/iQ Snapshots are always thinly provisioned for efficiency, only consuming storage space on the SAN for the data written to the snapshot, eliminating any upfront space reservation or guesswork that could lead to snapshot and backup job failures.
- Built into the P4000 SAN and Centralized Management Console, application integrated snapshots provide automated quiescing for Microsoft VSS enabled applications without additional software or hardware requirements. Sets of VSS snapshots are easily created, scheduled, and recovered using the CMC.

Remote Copy

- SAN/iQ Remote Copy lets customers replicate thin provisioned snapshots between primary and remote locations. Because remote copies are thin provisioned no space reservation at the remote location is required. Remote Copy is used for centralized backup and disaster recovery and can be set up on a per-volume basis. Remote copies placed on a recurring schedule allow customers to achieve point-in-time asynchronous replication of the data between locations, sites, or data centers.
- Integrated into the SAN/iQ Remote Copy software is intelligent bandwidth management ensuring that the data traffic can be sent across shared WAN links without adversely impacting other network traffic. Administrators simply set the bandwidth limit for remote copies between the two sites and the SAN/iQ software holds that limit.
- A failover/failback wizard is also included with Remote Copy for step-by-step, easy to execute disaster recovery procedures when needed most.
- Remote-Copy leverages application integrated snapshots to enable VMware and Hyper-V VMs as well as Microsoft VSS applications to be replicated in a quiesced state, providing faster application recovery.

Performance Management

- The SAN/iQ Performance Management System is designed from the ground up to make it easy to obtain the performance metrics that customers need, when they need them. One click of the mouse and the Performance Monitor is up and running in the Centralized Management Console (CMC) so there is no external software to install. The monitor provides a short list of relevant statistics and counters, letting administrators obtain performance metrics rolled up to their preferred level of abstraction.
- The SAN/iQ Performance Monitor provides performance information on a per-application server/virtual machine, logical volume, snapshot, storage cluster, and storage node basis, so there's no wading through irrelevant statistics in search of pertinent information. The Performance Monitor's graphical user interface is simple and elegant, and each statistic includes a detailed explanation of what it means for SAN performance.

SmartClone Technology

- SAN/iQ SmartClone technology instantly replicates data volumes and data sets into virtual copies or "clones" without requiring additional storage space. Each volume clone lets administrators save

time and space in a variety of environments and applications, from server and desktop provisioning, to boot-from-SAN provisioning, to the rapid copying of production data into test and development environments.

- SmartClone technology is based on the space-efficient SAN/iQ Thin Provisioning architecture, and the volume clones can be used without limitation along with all other SAN/iQ features like Network RAID, Thin Provisioning, Snapshot, and Remote Copy. The feature works by taking any volume or snapshot and making one or many clones in an instant. The cloning function makes a permanent, read/write volume on the SAN, pointing back to the original volume's blocks instead of duplicating the blocks. By managing each clone as a pervasive volume, SmartClone eliminates any requirement for a volume, snapshot, or any of its predecessors to exist after the clone has been created, and also eliminates the need to run de-duplication software, because there are no duplicate blocks. The clone shares the original volume's blocks and uses copy-on-write semantics. SmartClone technology reduces storage costs and increases overall storage efficiency. Administrators can store "gold-master" system images on the SAN for virtual desktop and boot-from-SAN implementations, and quickly provision test environments using real production data. To simplify management, administrators can view all of the relationships between clones, volumes, and snapshots graphically in the Control Management Console.
- SmartClone technology leverages application integrated snapshots to enable Microsoft VSS applications to be cloned in a quiesced state, providing easier application testing and recovery.

Centralized Management Console

- The entire HP P4000 SAN is managed from the SAN/iQ Centralized Management Console (CMC). An administrator simply connects via the IP network to the storage nodes. Multiple data centers and sites of storage can be managed from a "single pane-of-glass" no matter where the nodes are physically located. The CMC also includes an integrated Performance Monitor providing administrator with detailed, real-time metrics and the ability to export statistics. All of the SAN/iQ features are managed from the CMC for simple, easy-to-manage storage.
- The SAN Status Home Page provides a single view of the entire storage environment. Critical information such as Alerts and utilization is displayed for all Management Groups in a single pane of glass.

HP P4000 G2 Related Software

HP LeftHand Recovery Manager

- Speeds and simplifies recovery of Windows files and folders
- Auto mount snapshots for LeftHand volumes
- Search and restore to recovery point to make recovered data available to end users

HP LeftHand Virtual P4000 SAN Appliance Software (VSA)

- The HP LeftHand P4000 Virtual SAN Appliance Software (VSA) is a Virtual Appliance that provides complete SAN functionality for VMware Infrastructure or Microsoft Hyper-V without external SAN hardware. By virtualizing the internal disk capacity of the server running ESX or Hyper-V, the VSA Software eliminates the need for external shared storage required to implement advanced hypervisor features
- Multiple VSA's running on multiple servers create a clustered pool of storage with the ability to replicate data across the hosts allowing volumes to stay on-line in the event of a server failure
- Small to medium businesses and remote office customers can lower their IT infrastructure costs and enable higher levels of protection for business critical systems without the purchase of additional hardware
- VSA Software deployed at remote sites are managed as virtual storage nodes using the same

Centralized Management Console used to manage your HP P4000 G2 SANs
- 1 year 9x5 software phone support and software upgrades included
- New Zero-to-VSA Automated Install and Deployment tool allows for fast and easy deployment of virtual SAN environments including scripting for ROBO/branch installations with ESX/ESXi.

NOTE: For more information visit: www.hp.com/go/vsa

HP Storage Essentials Storage Resource Management Enterprise Edition Software

- HP Storage Essentials software provides path aware management for HP P4000 SAN Solution.
- Its automatic discovery and topology visualization of the infrastructure around the HP P4000 increase people efficiency to deal with growth and complexity.
- HP Storage Essentials reduces cost of ownership by supplementing the capacity management of the P4000 with capacity optimization across the data path from application to virtual volumes to P4000.

NOTE: For more information visit: www.hp.com/go/storageessentials

HP Insight Remote Support Software

- For small and midsize environments: HP Insight Remote Support Standard provides basic remote monitoring, notification/advisories and service dispatch and can be installed on a shared HP ProLiant Windows application server. This software supports server and storage devices, including all P4000 SANs, and is optimized for environments with 1-50 servers. Ideal for customers who do not need proactive service delivery and integration with a management platform.
- For midsize and large environments: HP Insight Remote Support Advanced is integrated with HP Systems Insight Manager (SIM). It provides comprehensive remote monitoring, notification/advisories, dispatch and proactive service support for nearly all HP servers, storage, network and SAN environments, including all P4000 SANs. It also enables HP to deliver higher levels of proactive support in line with HP Mission Critical Services support agreements.
- Both HP Insight Remote Support solutions are available at no additional cost to customers with a valid warranty on HP technology, an HP Care Pack Service or HP contractual support agreement.

NOTE: For more information visit: www.hp.com/go/InsightRemoteSupport

HP Storage Management Pack for Microsoft System Center

The HP Management Pack for Systems Center Operations Manager provides seamless integration with Microsoft Systems Center Operations Manager and now System Center Essentials by integrating predefined discovery and state monitoring policies, event processing rules and tasks, and diagram and topology views for the storage system.

For more information:

http://h18000.www1.hp.com/products/quickspecs/14249_div/14249_div.html

HP Storage Management Pack can be downloaded free from the following website:
https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=SCOM

HP P4000 G2 Unified NAS Stretch your HP P4000 G2 SAN Solution investment by adding file and print services with a P4000 G2

Software

Gateway

Unified NAS Gateway. Unified NAS Gateways are optimized file and print server solutions that are built on industry-standard HP ProLiant servers and come with Microsoft Windows Storage Server 2008 R2 operating system pre-installed. Since they're Windows-based, network and active directory integration is easy, your tools and data protection applications run right on the box, and management has a familiar look and feel. Like many Network Attached Storage (NAS) devices, they support heterogeneous file serving environments and are pre-configured to install in minutes. A P4000 G2 Unified NAS Gateway is a file server gateway that adds IP-based services to your P4000. In addition to providing file and print services, all of your important client and server data can be managed, scaled, and protected on a P4000 G2 SAN solution.

Each P4000 G2 Unified NAS Gateway Node includes:

- Microsoft Windows Storage Server 2008 R2, Enterprise Edition
- Intel® Xeon® Processor E5503
- Two 300 GB LFF 15K 6G SAS drives
- P212 SmartArray Controller
- 6 GB RAM
- 6 GbE ports

Services Included with the P4000 G2 Unified NAS Gateway:

- Factory warranty for P4000 G2 Unified NAS Gateway is 1yr, 9x5, NBD for Hardware.
- P4000 G2 Unified NAS Gateway also includes services resulting in 3 yr of HW&SW, 9x5, NBD.
- Installation & Startup doable by customer or available from HP.

HP P4000 G2 1-node Unified NAS Gateway Node	BV875A
HP P4000 G2 2-node Unified NAS Gateway Node	BV876A

Application Solutions

The P4000 is the ideal solution for many customers running Oracle, Microsoft, SAP environments and those customers who are deploying virtual server and desktop technologies like VMware, Citrix, Hyper-V, and Oracle Virtual Machine. HP P4000 delivers enterprise functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HP P4000 SANs ensure that crucial business data remains available. This innovative approach to storage provides unique double fault protection across the entire SAN, reducing vulnerability without driving up costs the way traditional SANs can.

For customers, one of the greatest concerns is always database performance. With storage clustering, P4000 customers get industry leading, impressive performance along with the scalability, availability, and ease of management capabilities.

HP has developed best-in-class expertise in Oracle, Microsoft, SAP, and Virtualization Hypervisor technology through extensive testing with the HP P4000, HP servers, and management software; high availability and disaster recovery solutions; and backup and recovery on the Oracle, Microsoft, and SAP application platforms.

To learn more about p4000 specific white papers on Oracle, SAP, Microsoft, VMware and Citrix deployments go to the Resource Library on www.hp.com/go/P4000.

For an overview of HP Storage Solutions for Oracle, Exchange, SAP and Virtualization environments, visit the solution sites supporting each of these applications.
HP Storage for Oracle hyperlink to www.hp.com/storage/Oracle
HP Storage for Microsoft hyperlink to www.hp.com/storage/Microsoft

HP Storage for SAP hyperlink to www.hp.com/storage/SAP

Backup Options

Creating and end-to-end IP SAN storage solution

When combining a HP P4000 SAN Solution with the HP D2D Backup System, users can create an affordable end-to-end IP SAN storage solution that is both easy to implement an easy to maintain. From entry-level solutions for a remote or branch office to mid-range solutions that scale for multiple sites, HP D2D Backup Systems provide the optimal balance of affordability, manageability, and reliability to handle the data protection needs of your HP SAN Solution.

HP D2D4112 Backup System

The HP D2D Backup Systems provide price leading disk-based data protection for small or medium-sized data centers and distributed environments. Automate and consolidate the backup of multiple servers onto a single, rack-mountable device. Improve reliability by reducing errors caused by media handling. With 1.5 to 18 TB of usable capacity and speeds of up to 720 GB/hour you can significantly reduce your backup window and restore time. The D2D Backup Systems feature HP Dynamic deduplication allowing you to retain more data on disk for longer and enabling low bandwidth replication for cost-effective off-site backup and recovery. Included as standard on all D2D systems, support for both virtual tape library and NAS (CIFS only**) targets offers the ease of use and flexibility needed to integrate into your current IT environment.

* Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

** The addition of NAS as a target for backup is currently limited to the CIFS protocol, suitable for use in Windows-only environments. The authentication models for the CIFS protocol are "no authentication" or "local user level authentication". There is currently no support for Microsoft Active Directory authentication. Support for the NFS protocol for use in LINUX/UNIX environments and for Microsoft Active Directory authentication for the CIFS protocol will follow later in the year.

The HP D2D4112 Backup System is focused on the needs of mid-sized data centers and used as a replication target device for remote and branch offices, the 2U D2D4112 series delivers a scalable solution from 9 to 18 TB of useable capacity using a simple and cost effective 2U capacity upgrade and speeds of up to 720 GB/hour*. These devices automate the daily backup of multiple distributed servers through the flexibility of virtual tape library and NAS (CIFS only**) targets for backup applications.

* Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

** The addition of NAS as a target for backup is currently limited to the CIFS protocol, suitable for use in Windows-only environments. The authentication models for the CIFS protocol are "no authentication" or "local user level authentication". There is currently no support for Microsoft Active Directory authentication. Support for the NFS protocol for use in LINUX/UNIX environments and for Microsoft Active Directory authentication for the CIFS protocol will follow later in the year.

For more information on HP D2D Backup Systems, please go to: www.hp.com/go/d2d.

Service and Support, HP Care Pack, and Warranty Information

Service and Support	**Technology Services for increased uptime, productivity and ROI** TRUST HP storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage Systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best-the experienced professionals at HP Services. **Protect your business beyond warranty** Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business-by reducing downtime risks and providing operational consistency for mission-critical and standard business computing. **What HP Storage Technology Services can do for you** HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. **Choose the right level of support, deployment and integration services** HP support recommendations are designed to help you enhance technology operations and lower risk-and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs-Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network-plus, a full set of infrastructure services designed to power a Converged Infrastructure.
Optimized Care- delivers best performance and stability through deployment and proactive management practices	**Choose either**: **HP Critical Advantage Level 3 Service**-Choose this service when you need an end-to-end infrastructure support solution that encompasses server, operating system, hypervisor, storage, and network. It's the level of support well suited for business-critical applications running on virtualized and x86 infrastructures. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-1772ENW.pdf **Or**: **3-Year HP Critical Service**-Designed for environments where downtime cannot be tolerated, HP monitors your environment around-the-clock, 365 days a year. We implement improvement projects to mitigate risks and reduce incidents. If outages do occur, they are addressed immediately with access to our dedicated critical support escalation resources. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf
Standard Care-maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and	**Choose either**: **HP Critical Advantage Level 2 Service**-Opt for end-to-end infrastructure support including server, operating system, hypervisor, storage, and network in an environment running business critical applications on virtualized and x86 infrastructures. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-1772ENW.pdf

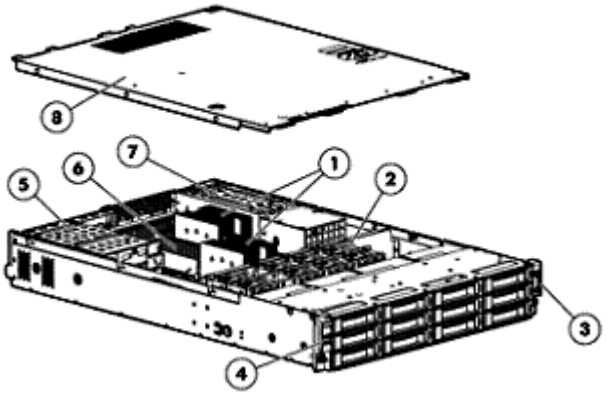
Service and Support, HP Care Pack, and Warranty Information

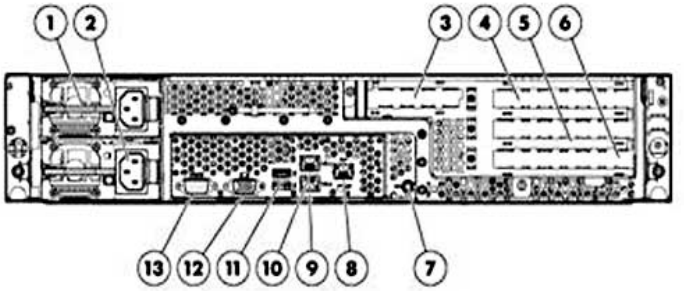
support	**Or**: **3-Year HP Proactive 24 Service**-This is the right choice for environments where some downtime is acceptable. HP helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9842EN.pdf
Basic Care-Minimum recommended support	**3-Year HP Support Plus 24**-This service provides support for environments where some downtime is expected. HP provides around-the-clock hardware and software support onsite, including third-party support. We also provide cost-saving software updates and monitor ongoing operations through the latest remote tools. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf **Plus**: **HP Proactive Select**-Choose from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education. (Includes 30 Proactive Select flexible credits.) http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf
HP LeftHand P4000 Virtual SAN Appliance Software support	HP LeftHand VSA includes one year of HP Software Support, standard 9x5 business hours phone support (software technical support and software product and documentation updates) and a 90 day media replacement only warranty. Including software updates and comprehensive support enhances the performance and availability of your software. Experienced Response Center engineers provide trustworthy advice on issues such as software features and use, problem diagnosis and resolution, and software defect identification. **Software Licensing Terms** License keys enable all features of the HP LeftHand VSA, including storage clustering, managed snapshots, and remote copy. The full 10TB capacity of each LeftHand VSA is available with the standard license key. Keys are required for each individual VSA instance.
Implement right from the start	Whichever level of care you select, it includes: HP Installation and Startup Service for HP 4000 SAN Solutions, installs, sets-up and tests your hardware and software, on site-including configuration, delivers custom-tailored deployment of the storage so that it is properly integrated into your customer's environment. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA1-4008ENW.pdf **HP LeftHand VSA Software** - HP Installation and Startup Service provides installation and configuration of the product for smooth startup and better business outcomes. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA1-1567ENW.pdf
Remote Support Tools	**HP Insight Remote Support**-Count on proven technology to deliver secure, reliable 24x7 remote monitoring, diagnosis, and problem resolution, all available at no extra charge if you have an existing warranty, service agreement, or HP Care Pack Service with HP. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4676ENW.pdf
Additional services to	**HP Storage Data Migration**-Proven expertise and tools help you migrate data across your data center or

Service and Support, HP Care Pack, and Warranty Information

meet your needs	around the globe. http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-4107EN.pdf **HP Proactive Select**-Choose from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education. (Includes 30 Proactive Select flexible credits.) http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf
Customer Technical Training	Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. www.hp.com/learn/storage **NOTE:** A two day training course for P4000 SAN Solutions is available and recommended. Order part number HF383E (QTY 2). To order additional training seats simply specify an increased quantity (QTY 2 per additional seat).
HP Services Awards	HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit: http://h20219.www2.hp.com/services/cache/433028-0-0-225-121.htm
Additional Services Information	For more information about HP Care Pack Services for Storage, please visit: http://www.hp.com/hps/storage If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" http://www.hp.com

HP P4300 / P4500 / P4900 G2 Storage System





Front View:

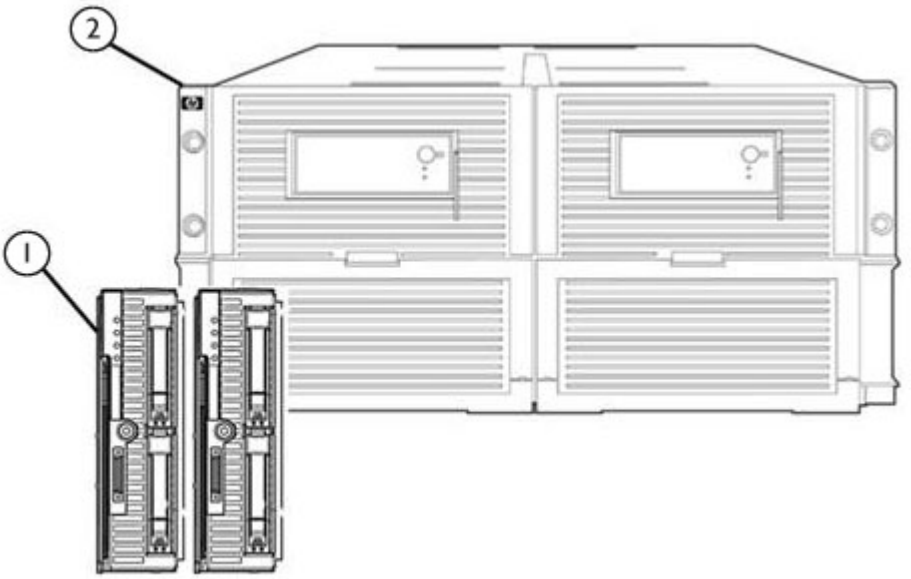
1. P4300 G2 and P4500 G2: One (1) Quad-Core Intel® Xeon® E5620 processor
   P4900 G2: (1) One 6-Core Intel® Xeon® 5670 processor
2. Non-Hot Plug, Redundant fans
3. Front UID LED/switch
4. Two (2) Front USB 2.0 ports
5. Twelve (12) DDR3 Unbuffered or Registered DIMM memory slots
6. PCI Cage
7. P4300 G2 and P4500 G2: Two (2) HP 750W Common Slot Gold Hot Plug Power Supplies
   P4900 G2: Two (2) HP 750W Common Slot Platinum Hot Plug Power Supplies
8. Access panel

Rear View:

1. Secondary Power Supply
2. Primary Power Supply
3. Low Profile x16 PCI-E Gen2 slot
4. Integrated CD-ROM (P4500 model in rear / P4300 model in front / not in P4900 G2)
5. Full height/full-length PCI Express Gen2 x8 slot
6. Full height/full-length PCI Express Gen2 x8 slot (P4900 G2 is populated with a dual-port 10GbE NIC: SFP connectors not included)
7. Rear UID LED/switch - Unit Identification LED to assist in rack storage maintenance
8. iLO 2 out of band management port (RJ-45)
9. GbE LAN port for NIC 2 (RJ-45)
10. GbE LAN port for NIC 1 (RJ-45)
11. Two (2) Rear Panel USB 2.0
12. VGA Port
13. Serial Port

Configuration Information

HP P4800 G2 SAN Solution for BladeSystem



1. P4460sb Storage Blade (2ea)
2. HP 600 Modular Disk System with 70 drives
3. (not pictured) 2m SAS Cable (4ea)

NOTE: For more options and details on the C7000 enclosure, visit:
http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/c7000/

Step 1 - P4000 Base Configuration
Choose a SAN that best fits your needs

SAN Configuration	Model Description	Part Number
	HP P4300 G2 16TB MDL SAS Starter SAN Solution	BK715B
	HP P4300 G2 7.2TB SAS Starter SAN Solution	BK716B
	HP P4500 G2 14.4TB SAS Virtualization SAN Solution	BQ888B
	HP P4500 G2 28.8TB SAS Multi-Site SAN Solution	BQ889B
	HP P4500 G2 60TB MDL SAS Scalable Capacity SAN Solution	BK717B
	HP P4500 G2 120TB MDL SAS Scalable Capacity SAN Solution	BQ890B
	HP P4800 G2 31.5TB SAS SAN BladeSystem	BV931A
	HP P4800 G2 42TB SAS SAN BladeSystem	BV932A
	HP P4800 G2 140TB MDL SAS SAN BladeSystem	BV933A
	HP P4900 G2 6.4TB SSD Storage System	QW932A
	HP P4900 G2 3.2TB SSD Storage System	QW933A
	HP P4500 G2 3.6TB SAS Storage System	AX699B
	HP P4500 G2 5.4TB SAS Storage System	AX700B
	HP P4500 G2 7.2TB SAS Storage System	AX701B
	HP P4500 G2 12TB MDL SAS Storage System	AX703B

HP P4500 G2 24TB MDL SAS Storage System	AX704B
HP P4300 G2 2.4TB SAS Storage System	AX698B
HP P4300 G2 3.6TB SAS Storage System	BK718B
HP P4300 G2 8TB MDL SAS Storage System	BK719B

NOTE: All P4000 SAN Solutions and Storage Systems are available factory racked: just add "#0D1" as a suffix to the Part Numbers listed above when ordering.

China Specific Solutions

All P4300 / P4500 / P4900 G2 SAN Solutions and Storage Systems ordered for sale in China should use the following part numbers:

Model Description	Part Number
HP P4300 G2 CN 16TB MDL SAS Starter SAN Solution	BK715BC
HP P4300 G2 CN 7.2TB SAS Starter SAN Solution	BK716BC
HP P4500 G2 CN 14.4TB SAS Virtualization SAN Solution	BQ888BC
HP P4500 G2 CN 28.8TB SAS Multi-Site SAN Solution	BQ889BC
HP P4500 G2 CN 60TB MDL SAS Scalable Capacity SAN Solution	BK717BC
HP P4500 G2 CN 120TB MDL SAS Scalable Capacity SAN Solution	BQ890BC
HP P4800 G2 31.5TB SAS SAN Solution for BladeSystem	BV931A
HP P4800 G2 42TB SAS SAN Solution for BladeSystem	BV932A
HP P4800 G2 140TB MDL SAS SAN Solution for BladeSystem	BV933A
HP P4900 G2 6.4TB SSD Storage System	QW932A
HP P4900 G2 3.2TB SSD Storage System	QW933A
HP P4500 G2 CN 3.6TB SAS Storage System	AX699BC
HP P4500 G2 CN 5.4TB SAS Storage System	AX700BC
HP P4500 G2 CN 7.2TB SAS Storage System	AX701BC
HP P4500 G2 CN 12TB MDL SAS Storage System	AX703BC
HP P4500 G2 CN 24TB MDL SAS Storage System	AX704BC
HP P4300 G2 CN 2.4TB SAS Storage System	AX698BC
HP P4300 G2 CN 3.6TB SAS Storage System	BK718BC
HP P4300 G2 CN 8TB MDL SAS Storage System	BK719BC

NOTE: All China Specific P4000 SAN Solutions and Storage Systems are available in factory racked: just add "#0D1" as a suffix to the Part Numbers listed above when ordering.

HP P4300/P4500 G2 Spare Components

While HP P4300/P4500 G2 Storage Systems have everything you need to be up and running, the following spare kits are available for purchase.

HP 2U Redundant Fan Kit	516009-B21
HP 750W Common Slot Platinum Hot Plug Power Supply Kit **NOTE:** For P4900 G2	593831-B21
HP 750W Common Slot Gold Hot Plug Power Supply Kit **NOTE:** For P4300 G2 and P4500 G2	512327-B21
HP 1200W Common Slot Platinum Hot Plug Power Supply Kit	578322-B21

	NOTE: Both P4300 G2 and P4500 G2 Storage Systems support DC power supplies. To enable DC support for each Storage System, two HP 1200W 48V DC common slot power supply kits must be purchased in addition to those originally shipped with the Storage System. DC power supplies contain a -48V DC power cord designed for rack DC power rectifiers.	
	HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
	HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
	HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
	HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632494-B21
	NOTE: HP Solid State Drives are equipped with HP SMARTSSD Wear Gauge™ which reports the amount of drive lifetime remaining. This data is made visible to the user through the user interface of the Centralized Management Console of HP LeftHand Storage Systems and via SNMP. The combination of HP SMARTSSD Wear Gauge and HP LeftHand appliance ensures you know the status of your solid state drives at all time so that you never need to worry about the loss of data due to drive wear. For more information on maximum usage limitations, view the HP SAS Solid State Drive quickspecs at http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html	

Step 2 - Options

P4000 Upgrade Options	HP P4000 G2 10G BASE-SFP+ Upgrade Kit	BQ891A
	NOTE: Use this kit to upgrade HP P4000 G2 Storage Systems (current model) to 10 GbE, and connect to a 10 GbE iSCSI network. It has 2 x 10GbE SFP+ ports per kit. One kit is needed for a Storage System, 2 kits are needed for a SAS Starter SAN / SATA Starter SAN / Virtualization SAN, 4 kits are needed for a Multi-Site SAN, and 5 kits are needed for a Scalable Capacity SAN. CABLES AND CONNECTORS NOT INCLUDED. For supported cables & connectors, please reference the NC550SFP QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13555_div/13555_div.html	
	HP P4000 10G BASE-SFP+ Upgrade Kit	AX705A
	NOTE: Use this kit to upgrade HP LeftHand P4000 Storage Systems (previous model) to 10 GbE, and connect to a 10 GbE iSCSI network. It has 2 x 10GbE SFP+ ports per kit. One kit is needed for a Storage System, 2 kits are needed for a SAS Starter SAN / SATA Starter SAN / Virtualization SAN, and 4 kits are needed for a Multi-Site SAN. CABLES AND CONNECTORS NOT INCLUDED. For supported cables & connectors, please reference the NC550SFP QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13555_div/13555_div.html	
HP P4000 G2 Unified NAS Gateway	HP P4000 G2 1-node Unified NAS Gateway Node	BV875A
	HP P4000 G2 2-node Unified NAS Gateway Node	BV876A

Configuration Information

HP LeftHand P4000 Virtual SAN Appliance Software	HP P4000 Virtual SAN Appliance Software Stock LTU	TA688AB
	HP P4000 Virtual SAN Appliance Software	TA688AA
	HP P4000 Virtual SAN Appliance Software E-LTU	TA688AAE

Step 3 - Other P4000 SANs Options

Description

Two 6' Highline (IEC-IEC) power cord ships standard per P4300/P4500 Node

NOTE: HP P4300/P4500 Storage Systems servers no longer ship standard with NEMA power cords (P/N 163719-002) that allow connection to 110V US wall outlets in a home or office. HP P4000 Storage Systems are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a HP P4000 Storage Systems using a 110V receptacle (NEMA-15), the NEMA power cord (AF556A) must be ordered separately. If customers require a power cord, they can check the power cord matrix for the appropriate cord. Please see the UPS and PDU cable matrix's on the Power Protection page under Power Cords that lists cable descriptions, requirements, and specifications for UPS and PDU units at the new HP Power Cord Link @ HP.com. Use the following new link: www.hp.com/products/powercords
NOTE: Rack models ship standard with IEC cables.

Step 4 - Choose Supported Options For iSCSI Infrastructure

Select each required option with quantities specified. The P4000 G2 SANs support servers with industry standard Gigabit and 10 Gigabit (SFP+) Ethernet components from various manufacturers that conform to IEEE 802.3ab (1000base-T) standards.

Description with Parts Shipped:

For details on standard Gigabit Ethernet components (including Gigabit Ethernet switches, Network Interface cards and Ethernet cables) from HP http://welcome.hp.com/country/us/en/prodserv/networking.html

Step 5 - Choose Rack Options

Select each required option with quantities specified.

Rack Airflow Requirements

Rack 10000 G2 series Cabinets The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.
CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).
CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.
Rack Kit HP P4000 G2 rack models have fixed rails which provide support for racks with round mounting holes and tool-free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 26" - 36".

Configuration Information

Telco Rack Support - Support for all 2 and 4 post Telco racks and threaded hole racks requires an additional option kit from Rack Solutions. The Rack Solutions brackets can be purchased at: www.hp.com/go/rackandpower.

NOTE: Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.

NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html

NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.

	P4300 G2 MDL SAS Starter SAN	P4300 G2 SAS Starter SAN	P4500 G2 Virtualization SAN	P4500 G2 Multi-Site SAN	P4500 G2 Scalable Capacity SAN	P4900 G2 6.4TB SSD Storage System	P4800 G2 SAN for BladeSystem*
Dimensions	4U			8U	10U	4U	15U
	6.9 x 17.64 x 28.23 in (17.52 x 44.80 x 71.71 cm)			13.8 x 17.64 x 28.23 in (35.04 x 44.80 x 71.71 cm)	17.25 x 17.64 x 28.23 in (43.8 x 44.80 x 71.71 cm)	6.9 x 17.64 x 28.23 in(17.52 x 44.80 x 71.71 cm)	26.25 x 17.64 x 35.08 in (66.68 x 44.80 x 89.12 cm)
Weight	76 lbs/34.46 kg		90 lbs/40.82 kg	180 lbs/ 81.64 kg	225 lbs/ 102.05 kg	75 lbs/34.01 kg	572.3 lbs/ 259.59 kg
Power/Cooling	Redundant Hot-Plug Common Slot Power Supplies (*DC also supported in P4300 G2 & P4500 G2)						Dependent upon final C7000 Enclosure Config.
	Auto-switching universal 115/220 Volts						
	5.3 belsA-weighted						
@115V	1418 BTU/hr	1760 BTU/hr	2248 BTU/hr	4996 BTU/hr	4205 BTU/hr	1594 BTU/hr	
	416 watts	524 watts	658 watts	1316 watts	1230 watts	466 watts	
@220V	1394 BTU/hr	1788 BTU/hr	2214 BTU/hr	4428 BTU/hr	4130 BTU/hr	1568 BTU/hr	
	408 watts	516 watts	648 watts	1296 watts	1210 watts	458 watts	

Environmental	**System Inlet Temperature**	**Operating**	10° to 35°C (50° to 95°F) at sea level with an altitude Derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30°to 60°C (-22°to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating 10% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing. Non-operating 5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.	
	Altitude	Operating 3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min). Non-operating 9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).	
Regulatory	EMC: Class A: CISPR 22:2005, EN 55022:2006, EN 55024:1998 +A1:2001 +A2:2003, EN 61000-3-2:2006, EN 61000-3-3:1995 +A1:2001 +A2:2005 Safety: EN 60950-1:2001		

Technical Specifications

* BladeSystem SAN numbers based on configuration within a C7000 BladeSystem Enclosure.

Additional information online

LeftHand home page	www.hp.com/go/lefthand
LeftHand VSA home page	www.hp.com/go/VSA
LeftHand VSA download	www.hp.com/go/TryVSA
LeftHand compatibility information	www.hp.com/go/lefthandcompatibility
LeftHand all things technical	www.hp.com/go/lefthandsupport

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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